REFERENCES 79

[59] C. Watt, J. Renner, N. Popescu, S. Cauligi, and D. Stefan, "Ct-wasm: Type-driven secure cryptography for the web ecosystem," *Proc. ACM Program. Lang.*, vol. 3, jan 2019.

- [60] R. M. Tsoupidi, M. Balliu, and B. Baudry, "Vivienne: Relational verification of cryptographic implementations in webassembly," in 2021 IEEE Secure Development Conference (SecDev), pp. 94–102, 2021.
- [61] Q. Stiévenart and C. De Roover, "Wassail: a webassembly static analysis library," in *Fifth International Workshop on Programming Technology for the Future Web*, 2021.
- [62] F. Breitfelder, T. Roth, L. Baumgärtner, and M. Mezini, "Wasma: A static webassembly analysis framework for everyone," in 2023 IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER), pp. 753–757, 2023.
- [63] S. Cao, N. He, Y. Guo, and H. Wang, "WASMixer: Binary Obfuscation for WebAssembly," arXiv e-prints, p. arXiv:2308.03123, Aug. 2023.
- [64] W. Fu, R. Lin, and D. Inge, "Taintassembly: Taint-based information flow control tracking for webassembly," arXiv preprint arXiv:1802.01050, 2018.
- [65] Q. Stiévenart, D. Binkley, and C. De Roover, "Dynamic slicing of webassembly binaries," in 39th IEEE International Conference on Software Maintenance and Evolution, IEEE, 2023.
- [66] Q. Stiévenart, D. W. Binkley, and C. De Roover, "Static stack-preserving intra-procedural slicing of webassembly binaries," in *Proceedings of the 44th International Conference on Software Engineering*, ICSE '22, (New York, NY, USA), p. 2031–2042, Association for Computing Machinery, 2022.
- [67] D. Lehmann and M. Pradel, "Wasabi: A framework for dynamically analyzing webassembly," in Proceedings of the Twenty-Fourth International Conference on Architectural Support for Programming Languages and Operating Systems, pp. 1045–1058, 2019.
- [68] S. Narayan, C. Disselkoen, D. Moghimi, S. Cauligi, E. Johnson, Z. Gang, A. Vahldiek-Oberwagner, R. Sahita, H. Shacham, D. Tullsen, and D. Stefan, "Swivel: Hardening WebAssembly against spectre," in 30th USENIX Security Symposium (USENIX Security 21), pp. 1433–1450, USENIX Association, Aug. 2021.
- [69] M. Kolosick, S. Narayan, E. Johnson, C. Watt, M. LeMay, D. Garg, R. Jhala, and D. Stefan, "Isolation without taxation: Near-zero-cost transitions for webassembly and sfi," Proc. ACM Program. Lang., vol. 6, jan 2022.

80 REFERENCES

[70] E. Johnson, E. Laufer, Z. Zhao, D. Gohman, S. Narayan, S. Savage, D. Stefan, and F. Brown, "Wave: a verifiably secure webassembly sandboxing runtime," in 2023 IEEE Symposium on Security and Privacy (SP), pp. 2940–2955, 2023.

- [71] M. Musch, C. Wressnegger, M. Johns, and K. Rieck, "New kid on the web: A study on the prevalence of webassembly in the wild," in Detection of Intrusions and Malware, and Vulnerability Assessment: 16th International Conference, DIMVA 2019, Gothenburg, Sweden, June 19–20, 2019, Proceedings 16, pp. 23–42, Springer, 2019.
- [72] S. Bhansali, A. Aris, A. Acar, H. Oz, and A. S. Uluagac, "A first look at code obfuscation for webassembly," in *Proceedings of the 15th ACM Conference on Security and Privacy in Wireless and Mobile Networks*, WiSec '22, (New York, NY, USA), p. 140–145, Association for Computing Machinery, 2022.
- [73] B. Baudry and M. Monperrus, "The multiple facets of software diversity: Recent developments in year 2000 and beyond," ACM Comput. Surv., vol. 48, sep 2015.
- [74] K. Pohl, G. Böckle, and F. Van Der Linden, Software product line engineering: foundations, principles, and techniques, vol. 1. Springer, 2005.
- [75] S. Sidiroglou-Douskos, S. Misailovic, H. Hoffmann, and M. Rinard, "Managing performance vs. accuracy trade-offs with loop perforation," in Proceedings of the 19th ACM SIGSOFT Symposium and the 13th European Conference on Foundations of Software Engineering, ESEC/FSE '11, (New York, NY, USA), p. 124–134, Association for Computing Machinery, 2011.
- [76] Avizienis and Kelly, "Fault tolerance by design diversity: Concepts and experiments," *Computer*, vol. 17, no. 8, pp. 67–80, 1984.
- [77] T. Y. Chen, F.-C. Kuo, R. G. Merkel, and T. H. Tse, "Adaptive random testing: The art of test case diversity," *J. Syst. Softw.*, vol. 83, pp. 60–66, 2010.
- [78] T. Jackson, On the Design, Implications, and Effects of Implementing Software Diversity for Security. PhD thesis, University of California, Irvine, 2012.
- [79] G. R. Lundquist, V. Mohan, and K. W. Hamlen, "Searching for software0 diversity: Attaining artificial diversity through program synthesis," in Proceedings of the 2016 New Security Paradigms Workshop, NSPW '16, (New York, NY, USA), p. 80–91, Association for Computing Machinery, 2016.
- [80] J. C. Knight and N. G. Leveson, "An experimental evaluation of the assumption of independence in multiversion programming," *IEEE Trans. Softw. Eng.*, vol. 12, p. 96–109, jan 1986.